

IN THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

1 1. (Amendment) A spin valve sensor comprising:
2 a first pinned layer having a first width and a first magnetic orientation;
3 a free layer having a second width disposed above the first pinned layer; and
4 a bias layer having the second width disposed above the free layer and a second
5 magnetic orientation orthogonal to the first magnetic orientation, wherein the second width is
6 smaller than the first width;
7 a second pinned layer having a third magnetic orientation anti-parallel to the first
8 magnetic orientation; and
9 a coupling layer disposed between the first and second pinned layers;
10 wherein a thickness of the first pinned layer is substantially equal to a thickness of the
11 second pinned layer.

1 2-3. (Canceled).

1 4. (Amendment) The spin valve sensor according to Claim [[3]] 1, further
2 comprising an anti-ferromagnetic (AFM) layer disposed adjacent to the first pinned layer.

1 5. (Original) The spin valve sensor according to Claim 4, wherein a
2 thickness of the AFM layer establishes exchange coupling between the AFM layer and the
3 first pinned layer.

6. (Original) The spin valve sensor according to Claim 4, wherein the first and second pinned layers are self-pinned.

7. (Amendment) A magnetic storage system, comprising:
a magnetic recording medium;
a spin valve sensor disposed proximate to the recording medium, the spin valve sensor, including:
a first pinned layer having a first width and a first magnetic orientation;
a free layer having a second width disposed above the first pinned layer; and
a biasing layer having the second width disposed above the free layer and a second magnetic orientation orthogonal to the first magnetic orientation, wherein the second width is smaller than the first width;
a second pinned layer having a third magnetic orientation anti-parallel to the first magnetic orientation; and
a coupling layer disposed between the first and second pinned layers;
wherein a thickness of the first pinned layer is substantially equal to a thickness of the second pinned layer.

8-9. (Canceled)

10. (Amendment) The magnetic storage system according to Claim ~~[[9]]~~ 7, further comprising an anti-ferromagnetic (AFM) layer disposed adjacent to the first pinned layer.

1 11. (Original) The magnetic storage system according to Claim 10, wherein a
2 thickness of the AFM layer establishes exchange coupling between the AFM layer and the
3 first pinned layer.

1 12. (Original) The magnetic storage system according to Claim 10, wherein
2 the first and second pinned layers are self-pinned.